ABSTRACT

A current-perpendicular-to-plane (CPP) giant magnetoresistive (GMR) sensor of the synthetic spin valve type and its method of formation are disclosed, the sensor including a novel laminated free layer having ultra-thin (less than 3 angstroms thickness) laminas of $Fe_{50}Co_{50}$ (or any iron rich alloy of the form Co_xFe_{1-x} with x between 0.25 and 0.75) interspersed with thicker layers of $Co_{90}Fe_{10}$ and Cu spacer layers to produce a free layer with good coercivity, a coefficient of magnetostriction that can be varied between positive and negative values and a high GMR ratio, due to enhancement of the bulk scattering coefficient by the laminas. The configuration of the lamina and layers in periodic groupings allow the coefficient of magnetostriction to be finely adjusted and the coercivity and GMR ratio to be optimized. The sensor performance can be further improved by including layers of Cu and $Fe_{50}Co_{50}$ in the synthetic antiferromagnetic pinned layer.